



# Omental necrosis masquerading as urinary retention following laparoscopic Roux en Y gastric bypass for super obesity

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## DECLARATIONS

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SL composed the manuscript, JK revised it, AM gave clinical advice and DB gave structural advice

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Omental torsion is a rare cause of abdominal pain requiring a high degree of clinical suspicion and often laparoscopy.

## Introduction

Omental torsion is a rare cause of an acute abdomen.<sup>1</sup> It often mimics acute appendicitis and other common pathological causes underlying acute abdominal pain. It is defined as axial twisting along its long axis and has primary and secondary classifications. Secondary omental torsion has an underlying aetiology which includes factors that increase intra-abdominal pressure: abdominal hernias, previous abdominal surgery and blunt and penetrating trauma. A common finding is for the central portion to tort due to fixed points above and below. It has a male preponderance (2:1) particularly in the fourth and fifth decades.

Symptoms include severe abdominal pain and nausea. Clinical examination often demonstrates localized abdominal tenderness and guarding suggestive of peritonitis. A palpable mass can be present if the omentum is large. Preoperative diagnosis has increased due to high-quality imaging to elucidate a definitive cause of an acute abdomen.<sup>2</sup> However, due to its atypical presentation and clinical similarities to other pathological processes it is often only diagnosed on exploratory laparoscopy. We report a case of secondary omental torsion that was only definitively diagnosed at re-laparoscopy following a laparoscopic Roux en Y gastric bypass.

## Case report

A 55-year-old man presented for an elective laparoscopic Roux en Y gastric bypass for super

obesity. His previous medical history included insulin dependent diabetes, hypertension, obstructive sleep apnoea, intervertebral disc disease and ischaemic heart disease. His admission body mass index (BMI) was 50 and this represented an improvement from an original BMI of >65 at clinic. Following an uncomplicated intraoperative procedure he developed severe lower abdominal pain on the first postoperative day.

Over a couple hours the pain became centralized and was relieved by lying prone. He became gradually distended and complained of being unable to pass urine but had no other abdominal symptoms. On examination he had a pulse of 120 beats/min and a blood pressure of 145/80 mmHg. He had a respiratory rate of 25 breaths/min and was saturating at 94% on 2 L O<sub>2</sub> (via nasal cannulae). Clinical examination of his abdomen revealed that he was not obstructed and had no signs of peritonitis. However, a large supra-pubic mass was palpable. He had a large residual volume of urine (>800 mL) that was not amenable to urethral catheterization necessitating the involvement of a urological team to insert a supra-pubic catheter.

He continued to experience worsening abdominal pain throughout the second postoperative day. His abdomen became more distended causing him to become short of breath thus increasing his oxygen support (i.e. >4 L O<sub>2</sub> via a face mask). An arterial blood gas demonstrated a developing lactic acidosis (i.e. >3.0) and a high leukocytosis (>18,000/mm<sup>3</sup>). Computed tomography (CT) chest and abdomen confirmed consolidation and a pleural effusion but no obvious abdominal pathology. This excluded the original clinical suspicion of an anastomotic leak (Figure 1). Ultrasound (USS) was not performed.

Due to inconclusive imaging and the lack of a definitive diagnosis he was taken back to theatre

**Figure 1**  
**Computed tomography (CT) abdomen. Distension is clear. Level T12. Note no obvious omental injury**



for a mandatory re-laparoscopy. This revealed a non-specific fibrinous coating over the small bowel. On deeper inspection the anastomosis appeared intact and healthy (no anastomotic air leak was demonstrated). However, a large segment of necrotic omentum was found and subsequently divided and removed. No other abdominal pathology was identified. Pathological examination revealed vascular congestion and omental necrosis. The patient made a good recovery and was discharged home a couple weeks later.

## Discussion

The greater omentum is composed of four layers from the fatty peritoneum and extends from the greater curvature of the stomach to the abdominal organs.<sup>3</sup> Rotation about its long axis results in venous obstruction and subsequent congestion resulting in oedematous changes and vascular compromise. Predisposing factors include trauma and situations that increase abdominal pressure (e.g. obesity and laparoscopic surgery). Omental torsion is usually right sided due to it being longer and more mobile on that side. It has been postulated that the embryological origin of that side predisposes to fragile blood vessels.<sup>4</sup>

Due to it possessing a confluence of non-specific abdominal symptoms it can be a

diagnostic dilemma. The differential diagnoses include common pathologies such as acute appendicitis, acute cholecystitis, perforated peptic ulcer, pancreatitis and diverticulitis.<sup>5</sup> Consequently, omental torsion is misdiagnosed as acute appendicitis in the majority of cases. However, it should always be considered among a list of differential diagnoses for acute abdominal pain particularly if predisposing factors exist in clinical history.<sup>1-5</sup>

In our case the deteriorating clinical symptoms and signs did not provide a consistent picture to enable us to formulate a diagnosis. His super obesity and recent laparoscopic surgery represented two independent factors which predisposed him to encounter an acute increase in abdominal pressure. Obesity can be a contributing factor in up to 70% of patients diagnosed to have omental torsion.<sup>5</sup> However, the common post-operative complications following laparoscopic Roux en Y bypass are wound infection (2.98%), anastomotic leak (2.05%), gastrointestinal tract haemorrhage (1.93%), bowel obstruction (1.73%) and pulmonary embolus (0.41%) all of which are more commonly encountered in clinical practice.<sup>6</sup>

The use of radiology can play a role in making an accurate diagnosis and guide operative intervention. USS may reveal a hyperechoic non-compressible intra-abdominal mass that is adherent to the peritoneum of the abdominal wall.<sup>3,4</sup> The advantages of USS and Doppler are that both can be quickly performed in an unstable patient, both can eliminate other causes of an acute abdomen (e.g. acute cholecystitis) and demonstrate necrotic tissue due to vascular compromise. Historically, CT is the imaging modality of choice as it can identify the specific location of the torsion which is usually umbilical. It can shorten the list of differential diagnoses if it reveals a normal gallbladder and no acute appendicitis or diverticulitis.<sup>3</sup>

CT often shows the infarcted omentum as a well-circumscribed heterogeneous fatty mass containing a tangle of fibrous bands and dilated thrombosed veins. The image is characteristically described as diffuse streaking in a whirling pattern of fibrous and fatty folds of the mesentery. These non-specific findings are also suggestive of other diagnoses including mesenteric lipodystrophy, lipoma, liposarcoma and intestinal volvulus.<sup>5</sup>

Consequently, to elucidate a diagnosis early re-laparoscopy should be undertaken in a post-operative laparoscopic Roux en Y gastric bypass in cases of super obesity if the clinical examination and radiological findings are inconclusive. Our case highlights this diagnostic dilemma as CT failed to demonstrate a twisted omentum (Figure 1). Surgery therefore remains the gold standard and proves to be the only means to provide a diagnosis and formulation of a management plan in cases of diagnostic uncertainty.<sup>3</sup> This surgical approach typically occurs as a mandatory re-laparoscopy particularly in the case of unknown aetiology.

At laparoscopy intraoperative findings may include a necrotic and twisted omentum and the presence of intraperitoneal serosanguinous fluid alongside the absence of other and more common intra-abdominal pathology.<sup>3</sup> Incidentally, conservative therapy has been undertaken in stable patients having no complications if the imaging modality is diagnostic. However, in our case the patient was clinically unstable and therefore we recommend surgical intervention in suspected cases of omental torsion and patient instability as delayed treatment may lead to complications such as abscess formation and sepsis. This is particularly relevant if one considers the high rate of preventable and non-preventable adverse surgical events (18.7%).<sup>6</sup> Such an event in a bariatric patient could prove extremely difficult to ameliorate and therefore surgical

intervention should remain the management plan of choice.

## Conclusion

Omental necrosis can be a diagnostic dilemma and requires a high degree of clinical suspicion. Despite an improvement in high-quality imaging it remains a diagnosis of exclusion that often demands exploratory surgery as the definitive means of diagnosis. This is particularly relevant in patients displaying non-specific abdominal symptoms and signs postlaparoscopic surgery to prevent potential complications related to conservative management.

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